

James W. Parker  
Chair, Board of Environmental Protection  
17 State House Station  
Augusta, ME 04333-0017

Cc: Melanie Loyzim, Acting Commissioner, Maine Department of Environmental Protection  
Mr. Jason Mitchell, President and COO, Whole Oceans, LLC

December 17, 2018

RE: Appeal of Maine Pollutant Discharge Elimination (MEPEDS) Permit # 0037478  
and Wastewater Discharge License (WDL) # W009190-6F-A-N  
(Whole Oceans, LLC - location, Bucksport Maine)

VIA: Electronic and U.S. Mail

Mr. Parker;

I am filing this appeal of the above MEPEDS permit and WDL license documented by Mr. Gregg Wood, Maine Division of Water Quality Management and filed on November 21, 2018, as issues I had raised as an Interested Person on toxic mercury, in written form during the public commentary, were not adequately addressed. (see Attachment #1, Attachment #2)

Additionally, I had raised the issue that Total Ammonia should be tested in the effluent discharge during the winter months. (see Attachment #3) There is data that supports that Total Ammonia should be tested during the winter months, as its component uniodized ammonia is even more toxic to the river and bay fish and shellfish during cold temperatures. This data was reported out to the U.S. Department of Environmental Protection. (see Attachment #4)

Therefore, I am submitting this appeal as an aggrieved party, in accordance with DEP's *Organization and Powers*, 38 M.R.S. §§ 341-D(4) & 346; the *Maine Administrative Procedure Act*, 5 M.R.S. § 11001; and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 C.M.R. ch. 2. I am requesting the Board review this material and support Whole Oceans and Maine DEP in revising the permit and license accordingly.

As required, I have labeled all supplemental information as attachments to this appeal with the date and source. I have indicated where it is new information and request it be

included in the record. I am aware that electronic links are not acceptable to be included in the record, and some of the documents are lengthy, therefore I have provided numbered references to portions of those documents as required.

### **SUMMARY:**

In order for the Whole Oceans project to be successful it is imperative that no substantial harm by release of toxic materials into; the Penobscot River, the Penobscot Bay and the important fishing areas of the Gulf of Maine occurs. This is a goal that I believe is shared by all concerned.

The previous comments that I submitted in writing as an Interested Person during the commentary period, were submitted to help insure Whole Oceans success. They were submitted with the hope that a new successful business development would be the benefit of the Town of Bucksport and all those who are stakeholders. (see Attachment # 5)

That is still my intent. Corporations can be highly profitable and successful without negatively impacting the very resource, in this case the waters of the Penobscot River and Bay, that they rely on. Indeed, it is integral to their success that they do so.

In the Final Permit of Record, the Whole Oceans facility was described as utilizing source water from the Penobscot River as well as other sources, namely Silver Lake. The intake of these waters, in particular the waters from the Penobscot River, will be drawn in to the facility at various times and seasons from the combination water column consisting of river flowage and the tidal waters coming upstream.

These combined waters contains high levels of mercury, much of which is in inorganic form. This is due to the presence of a substantial amounts of mercury contained the tidal ebb, flow and the churn of sediments in the water column of the River. (see Attachment # 6)

In the Permit of Record, Whole Oceans described it's process of feeding and raising the fish from smolt to adult fish and the daily discharge of its effluent. This discharge, through the three phases of the Whole Oceans project will discharge from 4 million gallons per day up to 18 million gallons per day at final build out.

Methylmercury is created in aquatic environments when inorganic mercury is acted upon by microbes and in the presence of carbon. These microbes are contained in fish grow-out tanks due to the process of feeding juvenile and adult fish, and those fish generating solid and liquid waste.

Methylmercury, a compound of mercury, is a highly toxic pollutant and listed in the e-CFR §401.15 pursuant to section 307(a)(1) of the Clean Water Act.

In the course of Whole Oceans feeding process, the inorganic mercury contaminated input waters brought into the grow-out tanks, would become methalyzed and released back into the public's waters in the facilities effluent. To release methylmercury, a toxic pollutant, into the public's waters would constitute a violation of the Federal Clean Water Act. (see Attachments 11 & 12)

The Permit of Record describes the facilities water intake sources, sea water and fresh water, which would be released as a combined effluent and specifies the average discharge temperature. Due to its brackish make up and being seasonably warmer then the changing column of receiving waters, it could pierce or overshoot the protective wall of cold dense salt water. This protective barrier is currently preventing 19 tons of highly toxic mercury and methylmercury from encroaching further into the Upper and Lower Penobscot Bay. (see Attachment # 6)

While any project can contain unforeseeable risks, with any new undertaking it is important to try to minimize or eliminate the risks that can be addressed at the outset. Filtering and sequestering the mercury from the input water, and promptly removing that toxic material to an appropriate waste site, would address the issue of the highly toxic methylated discharge.

Likewise, the careful testing of the impact of a high volume of warmed water, well prior to the introduction of eggs, will allow Whole Oceans to make any adjustments to its facilities build out and operation, fulfilling its business and product marketing goals of "healthy fish, healthy planet, healthy people" (see Attachment # 13)

By adopting these simple preventative measures, through revision to the Effluent Permit of Record , can help insure that the current and future users of the public waters will not be harmed or disenfranchised.

### **Aggrieved Status - Standing & New Information Discovered:**

As an Interested Person on the Final Permit of Record, I have been following the permitting process closely.

I reside along the shoreline of the Belfast Bay which is connected, by its waters, to the Upper and Lower Penobscot Bay. I own 250 feet of shorefront, including the intertidal portion of the property that are covered twice a day by tidal waters from the Penobscot Bay. These waters, in addition to my family's use, are recognized by the State of Maine as "Habitat for Wading and Shoreline Birds" (see Attachment #14)

Subsequent to my submitting questions during the public review period, and the granting of the permit on November 21, 2018, through a FOAA submission I became aware of and reviewed the information contained in the Maine State District Court ordered study "Penobscot River System" (see Attachment # 6, Attachment # 7 )

The "Penobscot River System" study is a voluminous collection of information covering the Maine Courts and technical findings from November 2003 - September 2018. It describes in detail the extent and character of the mercury contamination upstream and downstream of the Whole Oceans water intake and effluent outfall pipes. In addition, the study details the remediation planned for sites just above and just below the Whole Oceans proposed intake/outflow.

Subsequent to reviewing the Penobscot River System" study, I sought out and read peer reviewed scientific technical data and have identified them below.

As as a former Business Development Manager, for Intel Corporation, and having worked 9 years at the David Sarnoff Research Center in Princeton New Jersey, I am familiar with reading and reviewing fairly complex technical and legal documents. Having served as a project and product manager, I am also familiar with reviewing and analysing systems designs. My review of the Whole Oceans Final Permit and License, was with an eye toward understanding how this facility, and its effluent, might function in the estuarial system, impact the Bay at large and the tidal portions of my property.

## POTENTIAL DAMAGE:

I and my family, like other members of the public, swim in the waters of the interconnected Bays. We eat the produce that comes from these waters provided by local shell and fin fishers. We consume the produce from those who grow the mussels, scallops and seaweeds, all of which are sold in local stores and further afield. Given that the waters of the river and bays intermix and flow in a complex manner, in the special case of mercury contamination the usual 1 mile limit from the effluent discharge pipe cannot be applied. This has been upheld by the findings of the Maine Courts.

The Final Permit and License published by Mr. Wood and filed 11/21/2018, contained the following statement:

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### ***“CONCLUSIONS”***

***“(e). Where a discharge will result in lowering the existing water quality of any waterbody, the Department has made the finding, following opportunity for public participation, that this action is necessary to achieve important economic or social benefits to the State.”***

The fishers and those who farm shellfish and sea vegetables would be disenfranchised and harmed by the effect of the above Maine DEP “Conclusion, (e)” as it relates to the waters immediately downstream of the Class SC delineation. Given that these waters are connected to the Penobscot Bay and the Gulf of Maine, in the case of methylated and inorganic mercury, the issues are grave and possibly irreversible.

(see Attachment #8)

Likewise disenfranchised and harmed would be any future aquaculturists who wish to rely on intake of these waters.

The Maine State District Court has ordered remediation of the mercury contamination above and directly below the intake and outfall pipe of the proposed Whole Oceans facility. This remediation is a result of “Maine People's Alliance and Natural Resources Defense Council, Inc. vs. HoltraChem Manufacturing Company, and Mallinckrodt Inc. Case 1:00-cv-00069-JAW”. (see Attachment # 6)

Judge Woodcocks findings, published on 09/02/15 in Document 829 1:00-cv-00069-JAW, summarizes well the nature of the issue, in terms which are clear and have been upheld throughout various appeals:

*“... the presence of a large pool of [mercury] contaminated mobile sediments (estimated at 320,000 tonnes) that has been trapped in the upper estuary” through “hydrodynamic processes”. Id. at ES-7. “*

*“Plaintiffs point out that the level of mercury in species such as lobsters, rock crabs, black ducks, and eels exceeds the safety standards established by the state of Maine, as well as the EPA reference dose established by the federal government. “*

*“In general, there are two types of mercury: inorganic and organic. “*

*“The type of organic mercury that most concerns the scientists is methylmercury,..”*

*“There is a process by which inorganic mercury becomes organic or methylmercury called methylation. Id. 32:10-24. Once released into the environment, inorganic mercury is ingested by bacteria and through their biochemical activity, a methyl group is attached. Id. As a result, what was inorganic mercury is released into the environment as methylmercury. Id. 31:8-13.*

*Methylmercury is in orders of magnitude more toxic than inorganic mercury. Id. 31:14-17. Scientists have recognized that there is a significant human health risk with methylmercury. The impact is most acute in the fetuses of exposed pregnant women.*

*Children born to women who had high mercury levels during pregnancy tend to experience a neurological developmental lag when compared with children born to women without elevated levels. Once the mercury-exposed child reaches school age, they have been documented to have slower motor speed, a poor concentration span, delays in language acquisition, and impaired cognitive function.”*

*“Methylmercury exposure is exacerbated by four phenomena: bioaccumulation, biomagnification, mobility, and non-degradability.*

*Bioaccumulation means that if a species [ingests] another species with mercury, the predator assimilates the mercury into its body and the mercury becomes attached to its tissues. Rudd 32:2-9.*

*Biomagnification refers to the principle that as mercury travels up the food chain, the higher up the food chain, the more concentrated the levels of methylmercury. Id. 31:14-32-4. Thus, predator concentrations are many orders higher than concentrations at the bacterial levels. Id. 31:23-32:1.*

*Furthermore, although over time some mercury and methylmercury becomes buried in sediment, it remains possible for mercury in either form to become mobile with the stirring of the water Case 1:00-cv-00069-JAW Document 829 Filed 09/02/15 Page 41 of 61 PageID #: 12797 42 currents, become deposited, and then to become re-suspended with further agitation. Id. 142:3-14.*

*Finally, unlike many other elements, methylmercury does not break down over time. Fisher 692:19-20 (“[Mercury] doesn’t break down the way an organic compound breaks down.”). The most common source for methylmercury exposure to humans comes from eating fish and shellfish. HoltraChem, 211 F. Supp. 2d 245.*

*When a person eats fish or shellfish, which have a high methylmercury concentration level, the mercury is nearly completely absorbed through the digestive process. Grandjean 794:19-25. The mercury is taken up into blood, circulated throughout the body, including penetrating the brain, and only a small amount is excreted. Id.*

*Once ingested, methylmercury stays in the body for several months. Id. 795:13-19. In a month and a half or forty five days, humans lose about fifty percent of mercury levels that existed directly after ingestion.”*

*“d. A Mobile Pool of Sediment - One of the puzzles about the mercury contamination of the Penobscot River has been why the River has not entirely flushed the mercury into the ocean.”*

*“Dr. Wayne R. “Rocky” Geyer presented a convincing explanation for the comparatively slow recovery of the Penobscot River estuary. 6 Tr. of Proceedings 1143:16-1163:25 (ECF No. 765) (June 10, 2014); 7 Tr. of Proceedings 1169:11-1272:4 (ECF 767) (June 11, 2014) (Dr. Geyer) (Geyer).*

*The Court finds Dr. Geyer’s testimony persuasive and adopts his expert opinions. Dr. Geyer is an expert in the circulation and sediment transport processes in estuaries and the coastal ocean. Geyer 1144:7- 12. He holds a Ph.D. in physical oceanography and works at the Woods Hole Oceanographic Institution. Id. 1146:11-15; 1143:18-21.*

*Once mercury is released into a river, it hitches a ride on minute pieces of sediment as it travels downstream. Id. 1149:3-14 (“[T]he mercury is mostly bound to the sediment, so that the -- the transport of mercury is mostly associated with the transport of the sediment.”). Some of the sediment is deposited on the river bed and over time is layered over with ensuing generations of less toxic sediment.*

*Dr. Geyer Case 1:00-cv-00069-JAW Document 829 Filed 09/02/15 Page 44 of 61 PageID #: 12800 45 focused on what happens to the sediment as it nears Penobscot Bay, and it turns out the sediment is subject to tidal forces and a salt barrier that affects the movement of sediment into the Bay. “*

*“Due to the “continuing risk to biota and human consumers,” the Phase II Report “recommends the establishment of a Remediation Program” that would Case 1:00-cv-00069-JAW Document 829 Filed 09/02/15 Page 9 of 61 PageID #: 12765 10 “involve[] three types of active remediation procedures.” Id.*

*These include some targeted removal of “contaminated mobile sediments” and “replacement with clean sediments,” as well as dispersal of a mercury “binding agent” in Mendall Marsh to lower total mercury concentrations and retard the production of methylmercury. Id.”*

In regard to methylmercury contamination, the key issues defined by Courts and scientists in the “Penobscot River Study” as they relate to the Whole Oceans permit and license, are as follows:

**“mobility”** - The intake waters that Whole Oceans will bring into its facility contain “sticky” inorganic mercury carried by the fine sediments in the floating mercury pool. These sediments which are stirred by both the natural forces in the tidal river environment as well as the the stirring of sediments during the backwashing of Whole Oceans intake screens, as well as the stirring from the output the effluent pipes on the river bottom sediments.

As stated in the Permit of Record, 4.65 million gallons of water per day will be discharged in Phase 1, 18.6 million gallons per day in Phase 3. All of these discharges occur under pressure. All of which can disturb additional inorganic and organic mercury that is currently trapped in the sediment of the river.



**“bioaccumulation”** - When this “sticky” mercury is drawn into the tanks with the intake water it will mix with and attach to the feed pellets. This feed is ingested, metabolized, methylated and excreted in their feces.

Some of the methylmercury will enter the fish kidneys, be concentrated and expressed in vaporous and aqueous form in their urine through their gills.

Some of the uneaten feed will drop to the bottom of the tanks where it will interact with the microbe and carbon rich bio- waste produced by the fish.

The aqueous and fine particle remnants of methylmercury in the feces and urine , will be discharged into the river and bay via the effluent. It will not be removed by the denitrification process and heavy sludge settling, or any typical waste disposal treatment prior to discharge.

While the Permit of Record shows UV-C treatment being utilized, by Whole Oceans, peer reviewed technical literature show the great variability and uncertainty of UV-C treatment for methylated mercury in waters that contain salt.

I could find no studies or literature where any claims were made of UV-C effectiveness on any waters containing inorganic mercury.

**“biomagnification”** - The waste discharged from the Whole Oceans facility will then be further interacted upon by other microorganisms contained in the receiving waters and consumed by plankton.

According to the DEP “Mercury (particularly methylmercury) clearly accumulates in coastal marine food webs. Two general food webs can be conceptualized: a benthic sediment community which includes macroinvertebrates; and a community that resides primarily in the water column, which includes phytoplankton and zooplankton as well as planktivorous and piscivorous fishes”

Filter-feeders, such as mussels and oysters, sea plants, and worms consume the methylmercury from micro-organisms and plankton.

Smaller and juvenile fish who feed on the planktons consume this methylmercury. Water borne insects and invertebrates who feed on the above will also be ingesting this methylmercury as will the sea plants and marsh plants who use the nutrient rich waters for their sustenance.

The carnivorous fish will consume this methylmercury by eating smaller fish. Scavengers such as lobsters will consume methylmercury directly by eating the remains of all dead creatures.

Crabs, clams, mussels and sea urchins will also consume the methylmercury when they eat algae and other plant forms and insects, along with decomposing matter such as dead fish, mussels, sponges and barnacles

Wading and shoreline birds such as ducks, loons, bald eagles, terns, sandpipers and herons consume methylmercury when they eat the insects, worms, estuarial plants, sea plants and small fish contained in the water, mud and sediments of tidal areas that utilize . All of the above have been seen foraging and hunting in the intertidal areas of my property and those properties adjacent to mine.

Humans consume fish, shellfish, sea vegetables and fowl harvested from this food chain which, as a result of biomagnification, contain higher and higher levels of methylmercury. Human consumers won't be able to see, or taste or smell the presence of methylmercury.

**“Non-degradability”** - Inorganic mercury does not break down in the natural environment. Unless physically removed it can persist for 100's of years. Which is why it must be captured, sequestered and physically removed from Whole Oceans input waters.

Methylmercury can travel, via tides, to the edges of the SC waters, and into the upper and lower Penobscot Bay, and that travel is dependent based on the seasonal changes in the water column.

As the methylmercury effluent, formed by the process of feeding and raising fish from egg to 10lb salmon for two years, is being discharged daily at a rate of 4-18 million gallons per day, 365 days a year, during summer and winter. As per the Permit of Record, the effluent is only to be tested in the summer months. Therefore, revision of the permit is needed.

In the “PHASE III ENGINEERING STUDY REPORT Penobscot River Estuary, published September 2018” by Amec Foster Wheeler Environment & Infrastructure, Inc., the engineering firm hired to address remediation, issues related to Whole Oceans facility are also raised.

The Amec Foster Wheeler report stated:

*“Although the Estuary has recovered significantly since the period of peak mercury discharge, the Phase II Study estimated it will take well over 100 years for mercury concentrations in Estuary sediment to decrease to a level consistent with regional background concentrations in sediment at the predicted rate of system recovery (PRMSP 2013).*

*The Penobscot River Mercury Study Panel concluded that the slow rate of decline of mercury concentrations in the Estuary is attributable, in part, to the presence of a large pool of mercury-affected mobile sediment retained in the Estuary and its associated recycling within the Estuary under the influence of the tide. “ (see Attachment # 9)*

As per the Permit of Record, The Maine State DEP has chosen not to test or model the flowage of effluent until after construction of the facility, and once it is up operational and producing adult fish , which is approximately 2 years after commencement of operation. I submit by that time, testing for flowage will be too late, as for two years they will already have been pumping effluent into the River.

In the matter of testing for Total Ammonia during the winter months, the testing and calculations needed are simple. To extend Whole Oceans testing regime for Total Ammonia to the winter months is easy to do, and highly critical as unionized ammonia is a highly toxic component of the facilities effluent stream.

As noted in my written comments submitted during the application period, ammonia in general is highly toxic to the rivers fish. I had referenced a study from The University of Illinois, Urbana that raised the issue of ammonia being even more toxic in cold/winter waters. I am now including the abstract of that study here. (Attachment # 4)

### **The Remedy Sought:**

1. For the Board to make a revision to the Permit and License, in order to bring Whole Oceans effluent into compliance with the Federal Clean Water Act.
  - a. For Whole Oceans to filter, sequester and remove all mercury carried in the input water prior to its entry into the grow-out tanks to prevent it from being methylated in those tanks and discharge with its effluent. To then remove the filter media to a toxic waste disposal site.
  - b. That Whole Oceans include the testing of the output of this filter as part of their normal daily operating, testing and reporting regime. And to do so in accordance with the EPA-823-R-10-001 Guidance for Implementing Methylmercury Water Quality Criterion published July 2010.
  - c. That Whole Oceans conduct two flowage tests as soon as the facility is able to produce the pressurized water discharge at the anticipated rate of at the 2 year grow-out period and prior to commencing any daily operation.

That these tests include :

- i. The dye study to test for transportation and dispersal of effluent waters and report its findings to DEP, already planned for but at a later date
  - ii. A second test, separate from dye occluded water, to test for the pressurized disturbance of river bottom sediment directly at the outfall pipe and report its findings to DEP
- d. That Whole Oceans conducts the testing of its effluent for Total Ammonia during the winter months, calculate the amount of unionized ammonia or simply test for Total Ammonia provide the data to DEP in order for DEP to do the unionized ammonia calculations

To date, Maine DEP has exempted fish hatcheries from discharging mercury into the public's waters, where the grow-out time is limited from egg to smolt, through the *Interim Effluent Limitations and Controls for the Discharge of Mercury* 06-096 CMR 519.

However, Whole Oceans Effluent and Discharge permit is for a new use, as their facility involves growing out 10 pound fish to maturity for a period of approximately a two years.

To apply an exemption that has been used for a very limited time for much smaller amounts of feed, would seem unwise and unnecessarily risky when the quality of the intake water into the facility can be addressed through a revision.

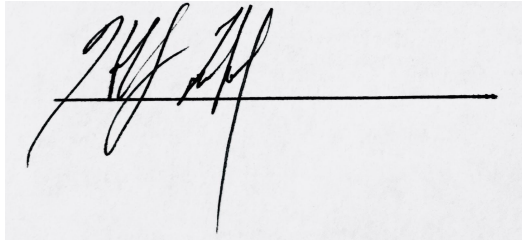
If the current permit and license are not revised, how will these toxic mercury-related issues and un-ionized ammonia issues be addressed?

Any corporation undertaking a large development project must deal with issues raised during the planning and development stages. Therefore, it behoves the executive management of Whole Oceans, LLC to address this issue now. Likewise, it is up to the Chair and Members of BEP to help the people of Bucksport, and the Corporation who seeks to conduct business there, to address this issue promptly.

I urge the Board Chair and the Board Members to act decisively in order to help Whole Oceans, the community of Bucksport, and all those who utilize the River and Bay's waters. To insure that the waters of the Penobscot River, Bay and Gulf of Maine are secured for the endangered aquatic species who migrate through it, for the Indian Nations whose traditional livelihood depends on it, and for all current and future users of its estuarial and tidal waters in Penobscot Bay and the Gulf of Maine.

In the matter of this appeal, I will act as the designated contact person to whom all orders, notices and correspondence regarding the appeal should be sent. I request that those be sent via email if possible, with a followup to the Post Office Box listed below.

Respectfully,

A handwritten signature in black ink, appearing to read 'Holly Faubel', is written over a solid black horizontal line. The signature is stylized and cursive.

Holly Faubel  
P.O. Box 216  
1 Steamship Point  
Belfast, ME 04915  
hollyfaubel@gmail.com  
480 250-665

## **REFERENCES AND NEW DATA ATTACHMENTS:**

**Attachment #1** : from Holly Faubel's written comments to the Whole Oceans permit application for Maine Pollution Discharge Elimination Permit, and Maine Waste Discharge License , dated 10/28/2018, page 1

“TO: Gregg Wood

FROM: Holly Faubel

10/28/2018

RE: Whole Oceans, LLC Pollution Discharge Elimination and Maine Waste Discharge Permit

In accordance with *Application Processing Procedures for Waste Discharge Licenses*, 06-096 CMR, 522, I am submitting these comments on the revision of the draft permit amended on Sept. 10th 2018 before close of comment period, end of day Oct. 29, 2019, for inclusion in Item 10 of DEP's 9/28/18 Proposed Draft Fact Sheet, ME0037478, W00910-6F-A-N. <sup>(1)</sup>

I was in receipt of this Amended permit after two requests and it was delivered on 10/26/2018. Like many members of the public, I was under the impression, that Whole Oceans would be discharging their effluent into a greenhouse facility as per their publicly posted website materials, rather than into Penobscot Bay. “

**Attachment #2:** from Holly Faubel's written comments to the Whole Oceans permit application for Maine Pollution Discharge Elimination Permit, and Maine Waste Discharge License , dated 10/28/2018, page 3

*“The presence of mercury in all of Maine's waters is well documented. Yet the design of Whole Oceans proposed facility does not take mercury mitigation into consideration. Indeed, the location of the intake pipe sandwiched between the two outflow pipes of Whole Oceans proposed facility would seem to be problematic. The mercury that is present in Maine's surface waters combined with the remnants of the residual mercury in the bed of the previous industrial paper factory, would seem to serve as a concentration source point. “*

*According to the DEP “To date the waters of Maine, due to mercury pollution are only approved for hatcheries”.<sup>(1)</sup>*

DEP has stated <sup>(1)</sup> *“The permittee discharges into estuarine waters of the Penobscot River which is strongly influenced by fresh water during high spring flows, large rainfall events, and during ebb tides. These condition make it difficult to accurately define the mixing characteristics of the permittees facility at any given point in time”. “Given the uncertainty of river flows to the east and west of Verona Island this permittee is to conduct a dye study once Phase 1*

*operations have commenced and steady state conditions with eggs, fry and smolts and adult fish in grow out tanks have been achieved.” The process of going from eggs to adult is going to take two years at a minimum. In the meantime, what assurances and bond does Whole Oceans give to the public local residents, recreational users, shellfish gatherers and growers, and sea vegetable farmers that their waters are not going to be polluted due to a lack of testing.”*

**Attachment # 3:** from Holly Faubel’s written comments to the Whole Oceans permit application for Maine Pollution Discharge Elimination Permit, and Maine Waste Discharge License , dated 10/28/2018, page 3

*“While warm weather testing might suffice for nitrogen levels, ammonia by DEPs own statements, is one of the most toxic pollutants in terms of the fish and shellfish health in the receiving waters. There are scientific reports (University of Illinois, Urbana) that show ammonia, the most toxic pollutant, is more hazardous to fish at colder temperatures.”*

**Attachment # 4:** from Final Report to U.S. Environmental Protection Agency Region V, Chicago, Illinois Walter Redmon, Project Officer, Effects of Cold Temperature on Toxicity of Ammonia to Rainbow Trout, Bluegills, and Fathead Minnows Contract Report 68-01-5832/B Center for Aquatic Ecology Keturah A. Reinbold and Stephen M. Pescitelli October 1982, reprinted January 1990, Center for Aquatic Ecology Illinois Natural History Survey 607 E. Peabody Dr. Champaign, IL 61820 .

*“ABSTRACT - The acute toxicity of un-ionized ammonia to rainbow trout (*Salmo gairdneri*), bluegill (*Lepomis macrochirus*), and fathead minnow (*Pimephales promelas*) was determined under flow-through conditions at low temperatures (3-5 0 C) typical of winter conditions and at higher temperatures typical of summer conditions for each species. The purpose was to determine whether ammonia toxicity differs under different seasonal temperature conditions. The 96-h LC50 values from replicate tests with rainbow trout averaged 0.47 mg/L un-ionized ammonia nitrogen (NH3-N) at 3-5 0C and 0.76 mg/L NH3 -N at 13-150C. For bluegill, LC50 values averaged 0.32 and 1.35 mg/L NH3-N at 4-50C and 24-250 C, respectively, while at the same temperature ranges LC50 values for fathead minnow were 0.60 and 1.17 mg/L NH3 -N, respectively. Thus, across the temperature span experienced from summer to winter for each species, bluegill appeared to be the most sensitive of the three species to the effect of low temperature on ammonia toxicity.”*



**Attachment # 5:** from Holly Faubel's written comments to the Whole Oceans permit application for Maine Pollution Discharge Elimination Permit, and Maine Waste Discharge License , dated 10/28/2018, page 5

"The purpose of Public Comments and Answers is to give the public at large input into the application process, and hopefully more than rudimentary responses. As such, the above Comments and Request for Response are being submitted in order to address public concerns in a manner that will elicit specific data that will address these important issues. The intent is that by doing so the public's concerns can be addressed, the public and DEP will have more substantive quantitative data to evaluate, and in the long run Whole Oceans operations will be the better for it."

**Attachment # 6:** Maine People's Alliance and Natural Resources Defense Council, Inc. vs. HoltraChem Manufacturing Company, and Mallinckrodt Inc. Case 1:00-cv-00069-JAW". Document 829 published 09/02/15. Pages indicated below:

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*".... the presence of a large pool of [mercury] contaminated mobile sediments (estimated at 320,000 tonnes) that has been trapped in the upper estuary" through "hydrodynamic processes". Id. at ES-7. "*

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*"Plaintiffs point out that the level of mercury in species such as lobsters, rock crabs, black ducks, and eels exceeds the safety standards established by the state of Maine, as well as the EPA reference dose established by the federal government. "*

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*Bioaccumulation means that if a species [ingests] another species with mercury, the predator assimilates the mercury into its body and the mercury becomes attached to its tissues. Rudd 32:2-9.*

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*Biomagnification refers to the principle that as mercury travels up the food chain, the higher up the food chain, the more concentrated the levels of methylmercury. Id. 31:14-32-4. Thus, predator concentrations are many orders higher than concentrations at the bacterial levels. Id. 31:23-32:1.*

Page 41

*Furthermore, although over time some mercury and methylmercury becomes buried in sediment, it remains possible for mercury in either form to become mobile with the stirring of the water Case 1:00-cv-00069-JAW Document 829 Filed 09/02/15 Page 41 of 61 PageID #: 12797 42 currents, become deposited, and then to become re-suspended with further agitation. Id. 142:3-14.*

Page 42

*Finally, unlike many other elements, methylmercury does not break down over time. Fisher 692:19-20 (“[Mercury] doesn’t break down the way an organic compound breaks down.”). The most common source for methylmercury exposure to humans comes from eating fish and shellfish. HoltraChem, 211 F. Supp. 2d 245.*

Page 42

*When a person eats fish or shellfish, which have a high methylmercury concentration level, the mercury is nearly completely absorbed through the digestive process. Grandjean 794:19-25. The mercury is taken up into blood, circulated throughout the body, including penetrating the brain, and only a small amount is excreted. Id.*

Page 42

*Once ingested, methylmercury stays in the body for several months. Id. 795:13-19. In a month and a half or forty five days, humans lose about fifty percent of mercury levels that existed directly after ingestion.”*

Page 44

*“d. A Mobile Pool of Sediment - One of the puzzles about the mercury contamination of the Penobscot River has been why the River has not entirely flushed the mercury into the ocean.”*

Page 44

*“Dr. Wayne R. “Rocky” Geyer presented a convincing explanation for the comparatively slow recovery of the Penobscot River estuary. 6 Tr. of Proceedings 1143:16-1163:25 (ECF No. 765) (June 10, 2014); 7 Tr. of Proceedings 1169:11-1272:4 (ECF 767) (June 11, 2014) (Dr. Geyer) (Geyer).*

Page 44

*The Court finds Dr. Geyer’s testimony persuasive and adopts his expert opinions. Dr. Geyer is an expert in the circulation and sediment transport processes in estuaries and the coastal ocean. Geyer 1144:7- 12. He holds a Ph.D. in physical oceanography and works at the Woods Hole Oceanographic Institution. Id. 1146:11-15; 1143:18-21.*

Page 44

*Once mercury is released into a river, it hitches a ride on minute pieces of sediment as it travels downstream. Id. 1149:3-14 (“[T]he mercury is mostly bound to the sediment, so that the -- the transport of mercury is mostly associated with the transport of the sediment.”). Some of the sediment is deposited on the river bed and over time is layered over with ensuing generations of less toxic sediment.*

Page 44-45

*Dr. Geyer focused on what happens to the sediment as it nears Penobscot Bay, and it turns out the sediment is subject to tidal forces and a salt barrier that affects the movement of sediment into the Bay. “*

Page 9

*“Due to the “continuing risk to biota and human consumers,” the Phase II Report “recommends the establishment of a Remediation Program” that would Case 1:00-cv-00069-JAW Document 829 Filed 09/02/15 Page 9 of 61 PageID #: 12765 10 “involve[] three types of active remediation procedures.” Id.*

Page 10

*These include some targeted removal of “contaminated mobile sediments” and “replacement with clean sediments,” as well as dispersal of a mercury “binding agent” in Mendall Marsh to lower total mercury concentrations and retard the production of methylmercury. Id.”*

**Attachment # 7:** from email regarding FOAA request to Department of Marine Resources, November 13, 2018

**From:** "Mendelson, Meredith" <[Meredith.Mendelson@maine.gov](mailto:Meredith.Mendelson@maine.gov)>

**Date:** November 13, 2018 at 8:49:15 AM EST

**To:** "[andrewsteve@icloud.com](mailto:andrewsteve@icloud.com)" <[andrewsteve@icloud.com](mailto:andrewsteve@icloud.com)>

**Subject: RE: FOAA request to DMR**

Hello Mr. Stevenson,

I am sorry for the delay in fulfilling your request. We have some data that needed to be excluded due to federal and state confidentiality provisions for landing statistics, so I had to ask staff to re-run some of the queries that had already been completed. I'm hopeful I will be able to get it to you within a couple of days.

In the meantime, the website I referenced regarding the Penobscot Bay Mercury Study data and reports is here:

<http://www.penobscotmercurystudy.com/>

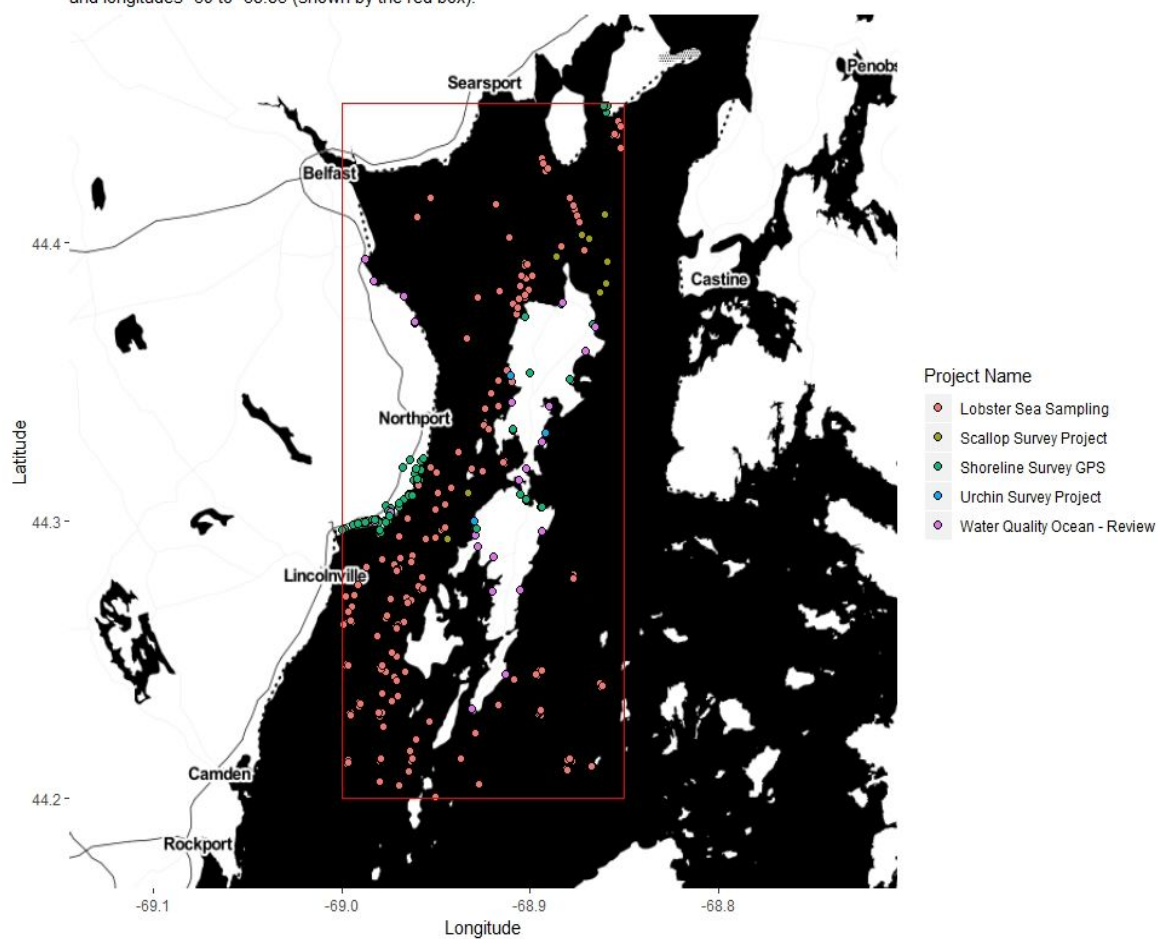
Thanks,

Meredith “

## **Attachment # 8:** Maine Department of Marine Resources sampled 2014

### **Maine DMR Sample Locations**

Sampled after 01/01/2014 and located between latitudes 44.2 to 44.45 and longitudes -69 to -68.85 (shown by the red box).



**Attachment #9:** PHASE III ENGINEERING STUDY REPORT Penobscot River Estuary, Maine Prepared for: United States District Court District of Maine Prepared by: Amec Foster Wheeler Environment & Infrastructure, Inc. 511 Congress Street Portland, Maine 04101 Project No. 3616166052 September 2018 Executive Summary.

Page 9

*“Although the Estuary has recovered significantly since the period of peak mercury discharge, the Phase II Study estimated it will take well over 100 years for mercury concentrations in Estuary sediment to decrease to a level consistent with regional background concentrations in sediment at the predicted rate of system recovery (PRMSP 2013).”*

Page 4

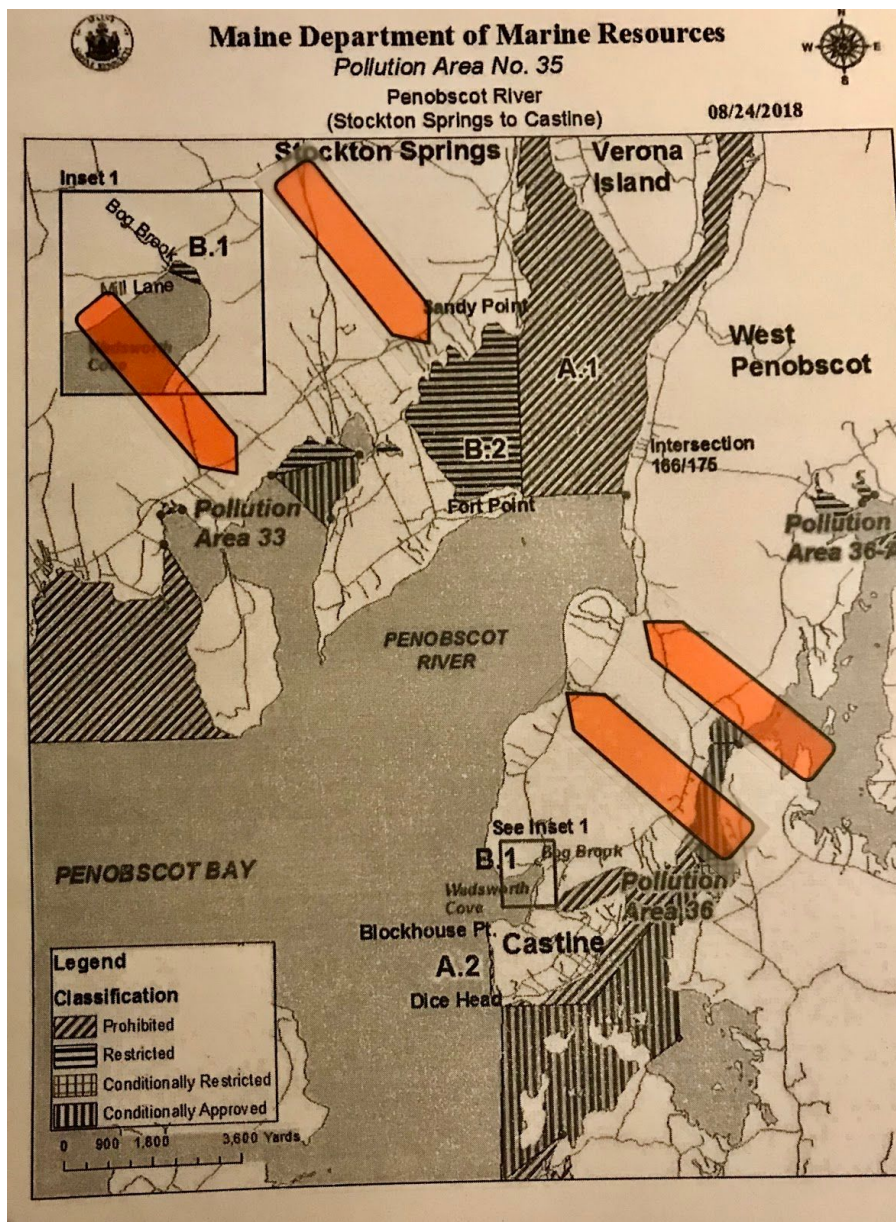
*“The Penobscot River Mercury Study Panel concluded that the slow rate of decline of mercury concentrations in the Estuary is attributable, in part, to the presence of a large pool of mercury-affected mobile sediment retained in the Estuary and its associated recycling within the Estuary under the influence of the tide. “*

## **ATTACHMENT # 10:**

Page 2 of Holly Faubel's Public Comments re: Whole Oceans permit application submitted 10/28/2018

"As per DEP's statement on Page 3 (1) *"Where high quality waters of the State are an outstanding resource, that water quality will be maintained and protected"*.

The receiving waters immediately at the outfalls indicated are listed as SC Waters, Maine Department of Marine Resources Pollution Area 35 as shown in the photo below:



These waters are designated as Critical Salmon Habitat (as per DEP's Penobscot Rivershed, with Licensed Dischargers and Critical Salmon habitat overlay) for the endangered Wild Atlantic Salmon whose numbers are just beginning to recover. It is also habitat and migratory path Endangered Atlantic and Short Nosed Sturgeon. The orange arrows in the diagram (left) indicate those areas just below the proposed measured outflow that could be further restricted due to the discharge of Whole Oceans operation. This discharge won't even be measured for the first two years of operation. "

**Attachment # 11** Electronic Code of Federal Regulations

e-CFR data is current as of December 13, 2018, page 1

“ 45. Mercury and compounds”

**Attachment # 12:** Clean Water Act , Section 502, General Definitions, 1972, page 1, item 13

“ (13) The term "toxic pollutant" means those pollutants, or combinations of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will, on the basis of information available to the Administrator, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction) or physical deformations, in such organisms or their offspring.”





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RAS is a technique for raising fish in a closed, indoor, land-based system. Water is continuously recirculated through a purification system, which conserves water and eliminates the need for antibiotics.

Healthy fish.  
Healthy planet.  
Healthy people.



**THE CONSERVATION FUND**  
**What is Recirculating Aquaculture Systems (RAS)?**

This video was produced by our partners at The Conservation Fund, one of America's largest environmental non-profits with a dual charter to pursue environmental preservation and economic development. Through their Freshwater Institute, they have been directly advising Whole Oceans with this project.



